SOIL conservation

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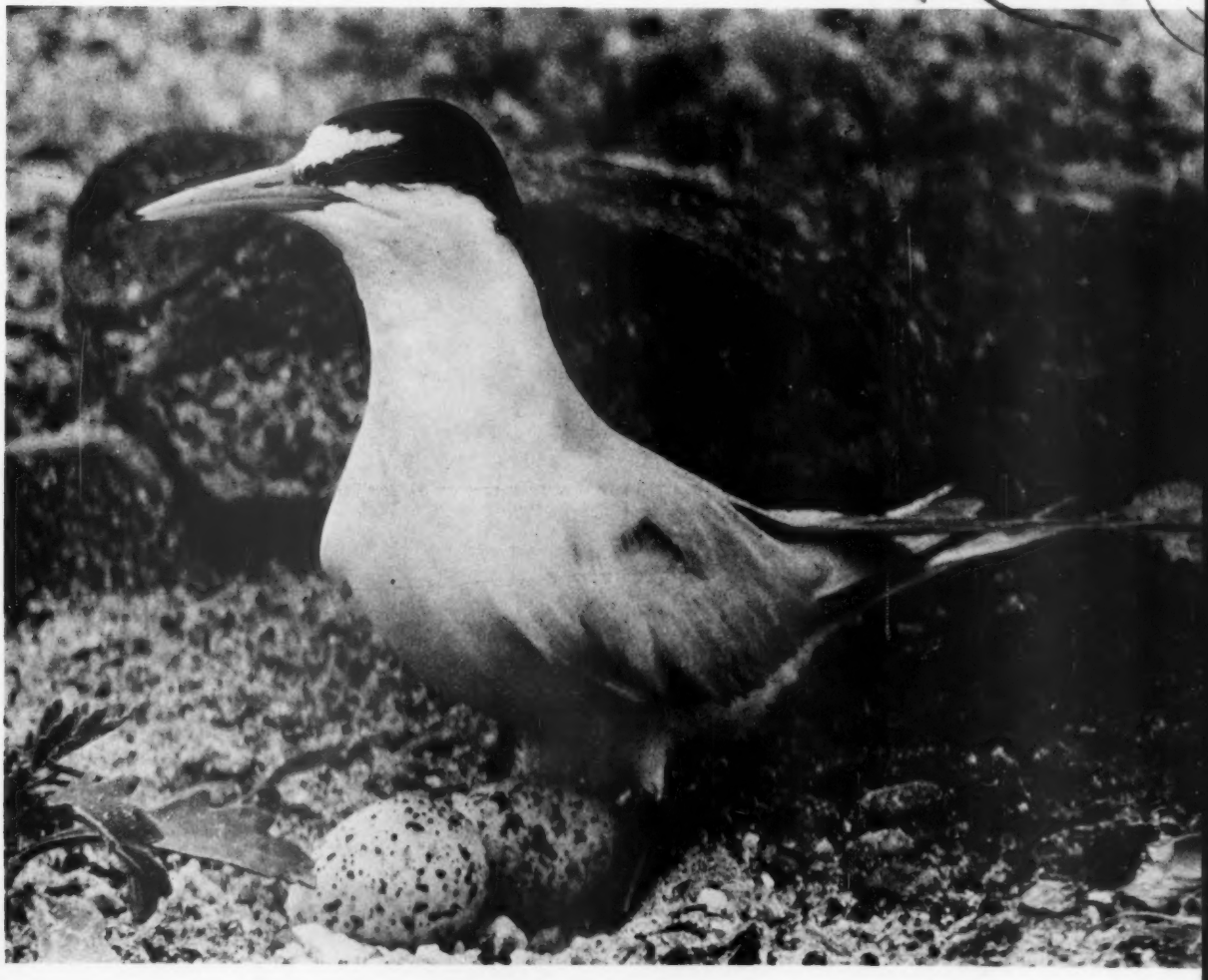

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March 1973, Vol. 38, No. 8

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Wildlife rates the best we can give

SOIL CONSERVATION spotlights wildlife this month, especially the efforts of groups and individuals in providing sanctuaries and creating new or improved habitats for wildlife. Note, for example, the dedication of townspeople in Wells, Maine, to preserving a shorebird habitat. And all the way across the country, residents of central Douglas County, Washington, have worked to preserve sage grouse strutting grounds. The motives are similar in still another setting—North Carolina. There a landowner replaced gullies on his land with food and cover for wildlife, and a group of landowners banded together to form a deer restoration project.

COVER: A least tern at nest, photographed by Patrick Grace, a photographer-naturalist from York Harbor, Maine, who coauthored the article about saving a shorebird habitat in Maine. (See p. 171).
OPPOSITE PAGE: A bull elk at the Ft. Niobrara wildlife refuge displaying a beautiful set of antlers.

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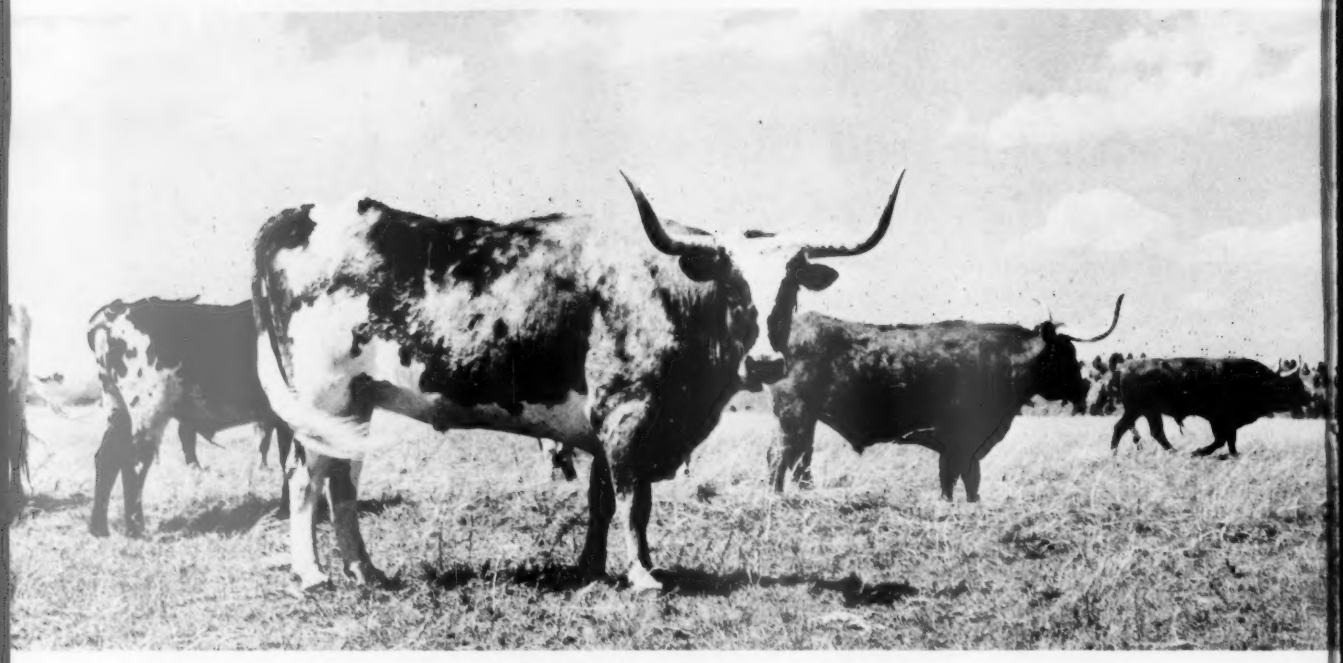
Home on the range –for elk and buffalo and Texas longhorns

by Wade H. Hamor
Regional biologist, SCS
Lincoln, Nebraska

As the little band of Mormons trekked across the Nebraska prairies in 1854, headed for Utah, an old cow broke train and ran into a Sioux village where she was shot by one of the braves —so the story goes. The residue of animosity led to war with the Sioux, which didn't end until the remnant of the tribe was rounded up and placed on the Rosebud Reservation in South Dakota in 1878.

Just across the line in Nebraska, to feed the Sioux and keep them peaceful, the U.S. Army established Fort Niobrara, named after the river along which it lies.



Texas longhorns have adapted well to Nebraska range.

In those days, buffalo and elk roamed the land and drank from the Niobrara at will. Then the Army introduced a new species of critter, the Texas longhorn, to the area. The longhorns were driven up in great herds from the South to feed the Sioux.

A. J. Abbott helped punch longhorns up from Dodge City and stayed on to become one of Nebraska's early cattle barons. And young Lieutenant "Black Jack" Pershing served his early career at Ft. Niobrara.

Today, Abbott is gone, and Pershing is someone to read about in history books. But the buffalo, elk, and longhorn are still there. Small herds of each are being preserved by the U.S. Department of the Interior's Bureau of Sport Fisheries and Wildlife, now in possession of what is left of Ft. Niobrara. The land was opened to settlers in 1913 and reduced to 14,000 acres. A few more have been added, so the holdings now total 19,122 acres.

Ft. Niobrara has become one of a few wildlife refuges where visitors can get acquainted with larger species, some of which are few in number and others hard to see in their native habitat.

Elk are fairly plentiful but, when they run wild, are skittish about visitors. Buffalo, reduced in 1900 to about 300 in all of North America, are increasing in numbers and attract a lot of attention. Texas longhorns are now an established breed, after having been almost eliminated in the evolution of beef animals.

If you have anything to say to either of these species, you can say it at Ft. Niobrara—through a fence or at safe distance. The herds are there partly for their own preservation and mainly for the enjoyment of people.

Early in 1950 some questions arose about animals and grasses at the refuge. How do you manage the ranges to keep animals sleek and fat yet keep the grasses productive in the years ahead? Can you fence for better management and yet leave plenty of room for elk to run, buffalo to roam, and longhorn to range?

Biologists of BSF&W and range conservationists of the Soil Conservation Service got together to update the range management program, and they began with a range site and condition survey and a study of the feeding habits of the animals.

Buffalo are not buffalo at all, but bison. They feed somewhat like the domestic cow to which they are related. They are cloven-hoofed and chew their cuds and will cross with a cow to produce a *cattalo*.

Elk eat a wider variety of foods, including grass and herbaceous plants, and they browse. They feed on native grasses, but given the chance they also feed on aspen and mixed shrubs.

The Texas longhorn is a cow and so is at home on the range summer and winter.

Because elk browse as well as graze, they skim the top of the grasses. Buffalo follow elk, cleaning up the range down to what is considered proper use. The rule of thumb is to take half, leave half. Resting in rotation, the range forage plants will bounce back for the longhorns to use as grazing or to be cut for hay for them.

In the plan, then, the 1,045-acre elk unit gets some early spring grazing by buffalo to rest the regular buffalo ranges for their improvement.

The two buffalo ranges are on either side of the elk unit, to make switching easier. One range is north of the Niobrara River where there are canyons for the buffalo to take shelter in winter, even though they can stand more cold than most species. Buffalo, in contrast to the domesticated cow, turn their heads to the wind so the hair lies flat for more warmth. They also dig through the snow for the dormant grasses.

Buffalo calves and mothers stay away from the herd until the young are strong enough to travel, so the whole herd is moved out of the canyons before calving time. The buffalo are moved to the 4,400-acre range where they drop their winter coats, produce milk for their young, and become fat and sleek on the lush native range.

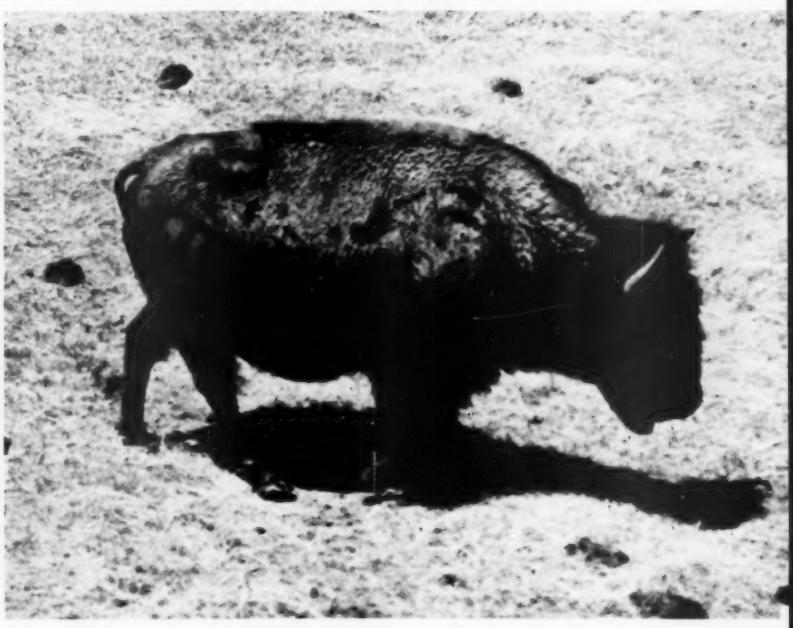
Buffalo herd fairly easily with a car or truck, but they hate horses.

Longhorns are not known for sweet dispositions either, but they do herd better—unless they get angry. Grazing like cattle, they can clean up a range in a matter of days. That's why they are allotted 11 pastures in their grazing system. Now that herd registry is established, bulls are selected on the basis of size, color, horn spread, and conformity. The best specimens weigh a ton and look as if they stampeded through a paint store with 6-foot horns running interference. Steers weigh less than bulls.

There are only two government herds of longhorn cattle—one at Ft. Niobrara and one in Okla-

The buffalo roam . . .

and roam . . .



homa. USDI acquired a few in 1926 when they were at the point of vanishing.

The small herd of 50 elk at Ft. Niobrara is for exhibition only. These graceful animals do well in captivity. They are easy to keep, breed readily, and soon become accustomed to people. Bull elk grow beautiful antlers, which they shed each year.

The herds of buffalo and longhorn are maintained at about 300 each, to use but not overuse the ranges and to perpetuate both animals and grasses for people's enjoyment in the years ahead.

To meet objectives—preservation of species, enjoyment by visitors, and studies where needed—takes more management than meets the eye at Ft. Niobrara. Dividing up the ranges took 14 miles of "horse-high, bull-strong, pig-tight" fencing. Buffalo can breach the fence anywhere and anytime, but they don't know it. Elk can jump anywhere they please. One management secret is to keep them all well fed so they don't find out these things.

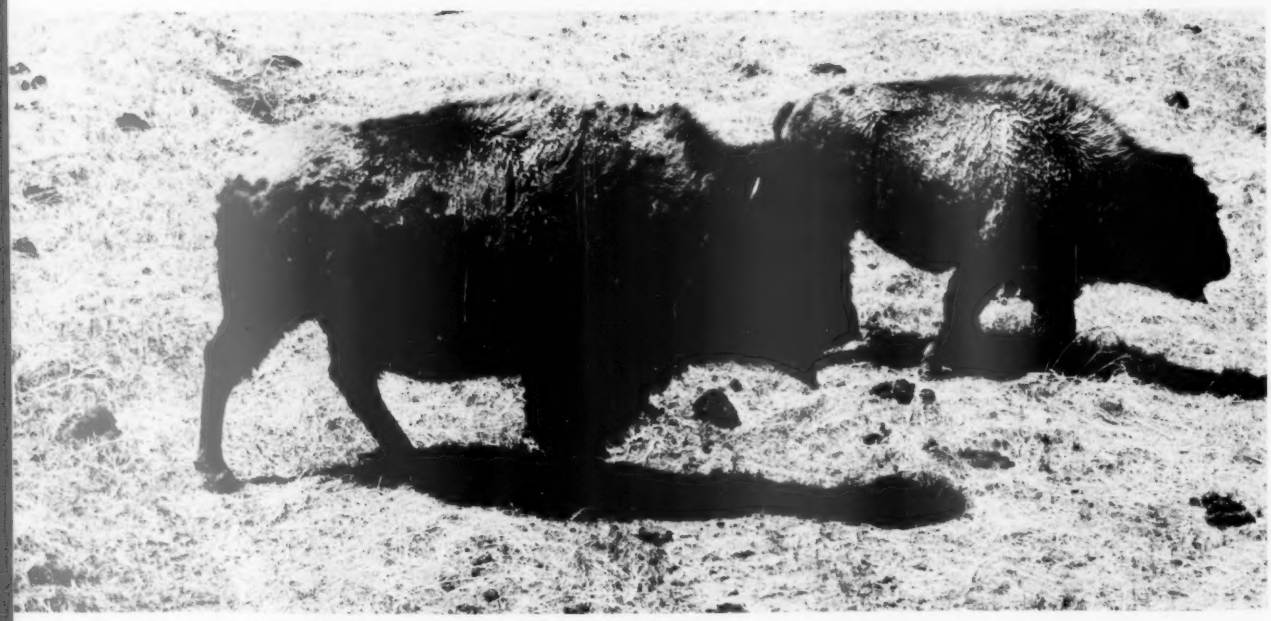
There are 18 dug wells, all equipped with windmills, to provide plenty of water to help keep the animals contented.

Want to buy a buffalo, elk, or longhorn? You can't, but if your town needs or wants one for its park or zoo, it can probably get one at Ft. Niobrara. Sales are to units of government only or to other nonprofit agencies.

Does your taste run to buffaloburger, elk steak, or longhorn prime rib? Your church, club, or any public organization can buy a quarter or half of an animal, but it must apply to make a purchase and wait until the slaughter season. Front quarters of buffalo, which include the hump, weigh up to 300 pounds. Humps make the best burgers, but the best steaks are from the hindquarters, which weigh 175 pounds or more. Most surplus animals are sold at auction each year.

You can visit and enjoy the animals any time at Ft. Niobrara. And during the summer there are also prairie dogs, pheasants, and thousands of birds to help entertain you. ♦

and roam, at Ft. Niobrara Wildlife Refuge.



New game bird takes to California –and to strangers

by Frank J. Menezes, Jr.
Civil engineer technician, SCS
Hanford, California

Rio Grande wild turkeys, direct from the Texas brush country, appear to have found a home to their liking in California.

These turkeys are big, tasty, and a challenge to hunt.

They are able to fly a mile out of gun range if necessary.

The man who accomplished the transfer of the new turkey strain to California is Richard Faggioli, owner with Duncan Patty of a 1,100-acre ranch in California's Tulare County, 50 miles north of Bakersfield.

About 8 years ago Faggioli visited an area inhabited by the Rio Grande turkey near San Antonio, Texas. From a blind he watched a flock of gobblers on a distant ridge. He noticed the terrain was strikingly similar to that of his California ranch in the Sierra Nevada foothills.

Because a flock of the Rio Grande turkeys need a range of at least 10,000 acres for a start, Faggioli needed the cooperation of neighboring landowners, and he got it. He also got assurances of help from the Soil Conservation Service staff at Visalia and from George Franklin of the California Department of Fish and Game.

The Faggiolo-Patty ranch gets 20 to 30 inches of rainfall a year and 6 to 20 inches of snow. Elevation ranges from 3,400 to 5,000 feet. The temperature can go from 90 degrees in summer to 15 degrees in winter. In some years snow will fall at the 3,500-foot level and stay for weeks.

The trees on the ranch are ponderosa pine, black oak, canyon live oak, and incense-cedar. Native shrubs are mostly mountain-mahogany, squawbush, and manzanita. Grasses and forbs include wild oats, California melic, blue and creeping wildrye, tarweed, bear clover, annual fescue, and an assortment of bromes.

Rio Grande wild turkeys from Texas are doing fine in northern Tulare County, California. These birds are 18 weeks old.

Rio Grande turkeys on winter range.

Experimental plantings for turkey use provided by SCS have resulted in volunteer stands of Harding and bromegrasses and Lana vetch.

Faggioli arranged for three shipments of young turkeys for release on the ranch. To get ready for them he built a main holding pen, 30 feet long, 20 feet wide, and 7 feet high. He built releasing pens 1 to 3 miles from the big pen. These were 20 feet long, 8 feet wide, and 7 feet high. He put running water and feeders outside the pens, similar to those inside. This was to help keep the turkeys in the area for a time.

The first shipment of 75 young birds came in August 1968. Faggioli, with help from SCS and the California Department of Fish and Game, placed bands on the right leg of each turkey.

The first birds were released on September 6, when the turkeys were 17 weeks old. For a time they stayed near the pens but soon showed evidence of adapting to their new surroundings. By November all 75 turkeys had left the area and were seen as far as 4 miles away, but they all returned to the pens.

The second shipment of 78 turkeys came in July 1969. A delay in airline connection, causing the shipment to be without water for 24 hours, resulted in the loss of eight young birds. This shipment, however, seemed livelier and wilder than the first. These birds were banded on the left leg.

Ten birds at a time were released out of the second shipment, most of them at 2-week intervals. All of these turkeys remained extremely wild.

The third group of young turkeys was released in the summer of 1970, banded on both legs. These too remained wild.

The first mating of the transplanted turkeys occurred in April 1969. The winter had been hard, with temperatures as low as 10 degrees. Snow covered the ground for 93 days. The weather station recorded 67 inches of moisture. At one time, when the caretaker had been unable to distribute food because of the snow, several turkeys appeared on the highway searching for food.

That spring, some of the hens had their nests as far as 3 miles from the main pen. Soon hens were seen with trailing poults. Once 11 hens were sighted with 36 poults in tow.

Later observations indicated the hatches were occurring at different times. The poults ranged in size from that of a quail to a pheasant.

Gobblers caught and weighed after the first year averaged more than 17 pounds each.

There were unexpected incidents. In Sequoia National Park two gobblers and five hens learned to wait along the highway for handouts from tourists. Two gobblers, still taking handouts, were seen near the highway in July of 1972. One tourist reported he was attacked by a gobbler trying to get his sandwich.

The wild turkey population in northern Tulare County is estimated now at 625 adults. The county has a new game bird, and the outlook is good. ♦

Grounds for grouse

by Ernest A. Busek
District conservationist, SCS
Waterville, Washington

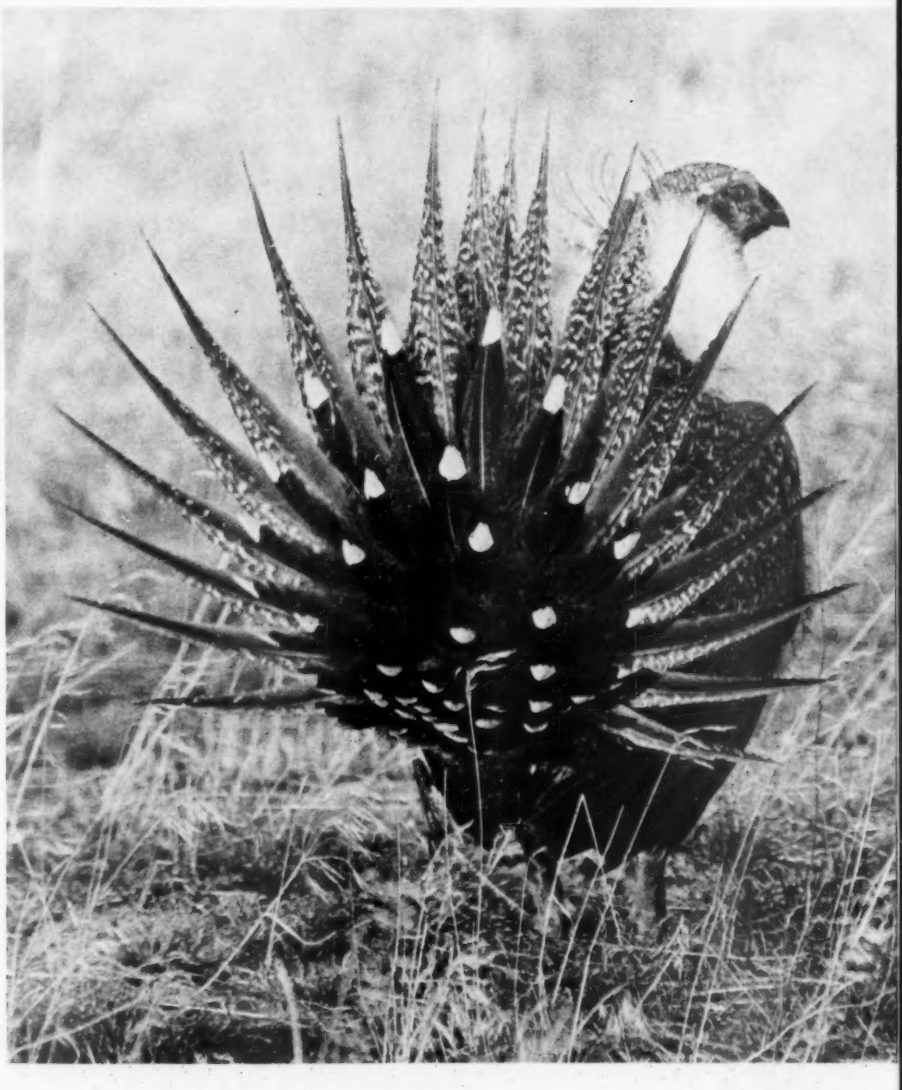
Sage grouse are not without friends in the dry range and wheat lands of Douglas County, Washington. Two essentials to their survival, strutting grounds and water, are being preserved and even improved by county residents.

To develop new water sources and preserve strutting grounds for the sage grouse required a several-step project that drew on the talents of biologists, engineers, conservation contractors, and, most important of all, the landowners.

In Douglas County, surface water is scarce, but there are many places where water is only a few feet below ground. In the right place, usually a wildrye basin, a dry lakebed, or a seep area, a 30-foot-square waterhole can be dug.

In the past 2 years about 35 landowners have dug 45 waterholes, each about 8 feet deep. A backhoe is used for digging. The sides of the waterholes are sloped, and in one corner a ramp is dug to provide easy access for four-footed animals.

Each pit cost between $75 and $100. Generally, federal cost sharing was available, and the Soil Conservation Service helped



Strutting sage grouse. (Photograph courtesy of Washington State Game Department.)

A wildlife watering pit. The giant wildrye provides excellent habitat for upland game birds and mule deer.

in locating the right spot to dig and in designing the pits.

The sage grouse strutting grounds are flat grassy areas where each spring this unique bird goes courting. First the males establish a territory; then they compete with each other in an attempt to attract females into their area by puffing out their chest, opening and closing their tail feathers, and emitting booming calls that come from their colorful throat pouches.

The grassy strutting grounds surrounded by sagebrush are essential to this species. Don Galbreath, Chet Ball, and Larry Wadkins, biologists with the Washington State Game Department, helped locate suitable strutting grounds in Douglas County.

Once the prime sites are located, ranchers and SCS people can plan brush control management programs to preserve enough of the sagebrush and thus insure continued use of the grounds by the grouse.

Sage grouse aren't the only benefactors. Throughout spring, summer, and fall, mule deer, mourning doves, song birds, hawks, owls, and coyotes find the watering pits tucked in patches of giant wildrye a welcome relief from the parched surroundings.

Environmental protection is not just a catchy phrase to the residents of central Douglas County. It is a plan of action, and the results make it all worthwhile. ♦

We care about birds

by David N. Allan
Biologist, SCS
Durham, New Hampshire

and Patrick W. Grace
Photographer and naturalist
York Harbor, Maine

A tern drifts like a small white kite against the summer sky. Plunging to the bay below it brings up a small killifish quivering in its bill. On the dunes below, the beachgrass scribes arcs in the sand as an onshore breeze sends sand particles scurrying across the flats. Nearby, faint pipping can be heard from two speckled eggs lying in a shallow cup of sand, soon to release the young terns struggling inside.

The setting is a landfill area of about 21 acres created in the sixties by a dredging project to deepen the Webhannet River at Wells, Maine. The area, teaming with summer life, was once part of the nearby marsh now set aside as the Rachel Carson Wildlife Refuge.

A local resident began observing the use of the landfill by the least tern in 1968. By 1969 at least 40 terns were nesting there. No counts were made in 1970 because the last dredging was being carried out. By the following year about 75 terns were using the fill.

Other birds, including the piping plover, horned lark, and killdeer, also were nesting in the area.

The least tern is not a rare and endangered species, but along the Maine coast it is an uncommon nester, mainly because most areas suitable for nesting are heavily used by vacationers. This tern prefers to nest on coarse sand or gravelly material that is free of vegetation. The piping plover tolerates more cover, and the horned lark nests in dense stands of beachgrass. Both terns and plovers line their nests with white clamshell fragments. These help bird watchers locate nesting sites.

By 1971 the natural revegetation of seaside plants such as sea rocket, common saltworth, amaranths, and beachgrass had begun. But the area was not protected, and it was soon invaded by dune buggies and other vehicles.

The town of Wells asked the steering committee of the Threshold of Maine Resource Conser-

A least tern chick and an unhatched egg. The least tern is an uncommon nester along the Maine coast because most areas suitable for nesting are heavily used by vacationers.

vation and Development Project for help in controlling wind erosion on this new land. The barren spoil was subject to severe wind erosion, and the blowing sands had an adverse effect on shellfish, the marsh, and a nearby restaurant and marina.

The Soil Conservation Service helped draw up three alternative vegetative measures. The first: completely vegetate the landfill using beachgrass. The second: use beachgrass around the perimeter of the area with alternate strips of beachgrass or a switchgrass-lovegrass seeding mixture; make the strips perpendicular to the prevailing winds. The third: completely seed the spoil to a switchgrass-lovegrass mixture.

Biologists, including Brad Sterl of the Maine Department of Sea and Shores Fisheries and Dick Anderson, director of the Maine Audubon Society, and others from several agencies also were called in to evaluate the problem. All pointed up the need of saving this shorebird habitat.

Their recommendation was that two alternate and parallel strips of open sand be maintained on the perimeter of the area. Out of 18 acres, 3 would be set aside for this purpose. And 3 acres nearby would be completely revegetated.

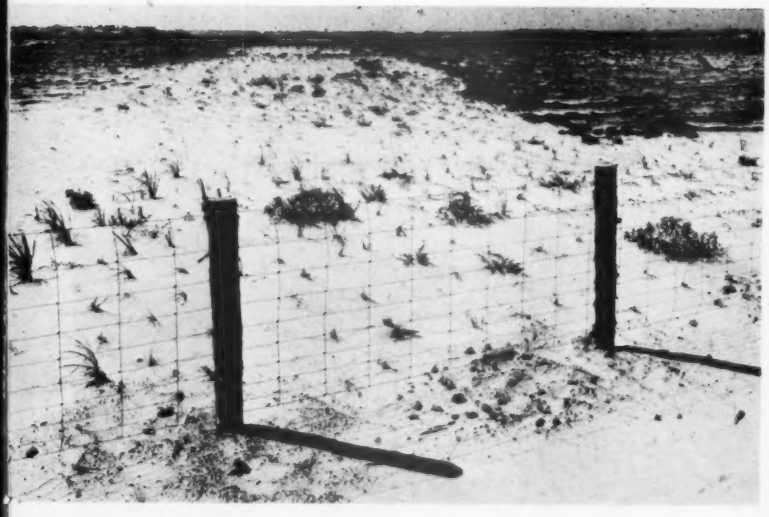
The sponsors of the RC&D project incorporated these suggestions into the second alternative seeding measure.

Pedestrian and vehicular control was needed. Dogs are especially destructive in shorebird nesting areas, so fencing was installed and rugosa rose was planted to discourage access. This rose is a common coastal plant that adds beauty to an area and provides food and nesting cover for songbirds.

Beachgrass was planted in the spring of 1972 by adapting a cabbage planter to set the grass sprigs. The alternate grass strips were seeded late in July after nesting had peaked. In the fall a grader was used to remove volunteer vegetation from the 50-foot nesting strips. This will have to be done periodically to maintain the nesting habitat.

This landfill was destined to become just another blacktopped shopping mall, motel, or cluster of cottages. Local people, the Wells Conservation Commission, and the RC&D project steering committee with much forethought have committed it to an open area by the sea—a rare and endangered thing these days—where a soaring tern can still be seen. ♦

A natural stand of American beachgrass occurs as volunteer growth in one area of the least tern colony—a 21-acre landfill.



(Top) The piping plover has found suitable habitat in what was once a barren spoil.
(Left) To control wind erosion, clones of American beachgrass were planted in strips perpendicular to the prevailing winds.
(Below) SCS recommendations for the area: 50-foot strips of clones of American beachgrass alternating with 50-foot strips of sown seed.
(Photographs by Patrick W. Grace.)

Small game, big gain

by Nat White
District conservationist, SCS
Randolph County, North Carolina

Some people believe that the best way to get more wildlife on rural land is to leave the land alone.

A father and son team in High Point, North Carolina, believes that wildlife needs all the help it can get—especially on a tract of land that looks like a desert.

Delbert Wilson and his son, Del Ray, bought 157 acres of land in Randolph County in 1969, fully realizing that they had a lot of work ahead of them to restore and improve the land. About 95 acres of the tract presented a generally bleak aspect—bare and eroded soil, sand, and exposed rock.

Back in the 1940's a previous owner had sold topsoil from those 95 acres, and with the topsoil gone, erosion had arrived and wildlife had left.

"When we bought this place," said Del Ray Wilson, "we could find only lizards and an occasional crow. Nothing else."

Today even a casual visitor to the Wilson place can see rabbits and quail—particularly when it's not hunting season. Del Ray Wilson says he has seen numerous red fox, and even one silver fox, as well as an occasional mink. Bullfrogs are also numerous, and the lizards and crows are still around.

The Wilsons from the start were determined to reverse the effects of 25 years of soil erosion on their land.

They became cooperators with the Randolph Soil and Water Conservation District. The Soil Conservation Service helped them prepare a conservation plan and gave technical assistance on the work to be done.

The first job was to smooth the severely gullied land, which had

Removing the topsoil left areas like this bare and unprotected.

4 to 10 percent slopes, so it could be seeded to grass. Two bulldozers, a dump truck, a pan for scraping dirt, and a tractor were needed for that job.

The work wasn't easy. The Wilsons recalled that the severe gullies and mudflats presented a real problem—"when it rained sometimes you had quicksand." But gullies disappeared, sediment runoff was reduced, and other progress was made.

Cost-sharing by federal agencies helped provide lime, fertilizer, and grass seed.

In February 1971, Delbert Wilson suffered a broken back, but his son followed through on the project.

Today, more than 50 of the 95 acres have been greatly improved, and work is underway on additional acreage. A lush growth of ladino clover and fescue has replaced the gullies, and wildlife is increasing.

Small streams on the tract are flowing clear, in contrast to the heavy load of sediment they carried only 3 years ago. Fish, once totally absent, are beginning to appear in the larger streams.

"The work will continue," said Del Ray Wilson. "When pastures are established, we want to bring in some Black Angus beef cattle. A 10-acre lake will complete the project, from the environmental point of view."

The Wilson family also hopes to build a modern house on an attractive site.

"When we're finished here," Del Ray Wilson added, "this place is going to make a real contribution to the economy and the environment of this county." ♦

A once stripped area shows good growth of ladino clover and fescue.

Wood ducks flock to

by Gary Bullard
Biologist, SCS
Claremore, Oklahoma

The largest natural lake in Oklahoma—150 surface acres surrounded by hardwoods and prime agricultural land—is owned by the Big Lake Club of Tulsa.

The club has been interested in conservation since the turn of the century. At that time, hundreds of hunters would come in by rail to the town of Verdigris and travel the remaining few miles by team and wagon to nearby lakes for a weekend of slaughtering ducks. Sometimes two and three train carloads of ducks were killed per weekend and sold commercially. An old tavern and dance hall were used for the hunters' headquarters and big celebrations took place before and after hunts.

In 1917, several men purchased the big lake and land immediately around it from the U.S. Department of the Interior. By 1946, trustees of the club had signed an agreement with the Rogers County Conservation District to set aside the area for a waterfowl refuge and management area. Last year, Don Welch, one of the trustees, came into the Claremore field office of the Soil Conservation Service and asked for help in updating the conservation plan.

"We want to provide more quality habitat for waterfowl," Welch said.

After discussion with the area engineer and the biologist, it was concluded that a green tree reservoir—the first one in Oklahoma—would be possible. The reservoir was to run parallel with the lake and the Arkansas-Verdigris navigation channel.

The plan required construction of almost 8,000 feet of dikes to flood 140 acres of hardwoods. The area is flooded in the fall after frost and drained early in spring. Water is obtained from the Verdigris River. The water depth in the flooded area ranges up to 18 inches. Tall fescue and small grains are planted on dikes, and other food plots are located in scattered open areas.

"We're proud of the project, but we'd like to do more," Welch commented. "Only part of the lake and woods are for hunting; most of the area serves as a refuge and resting place.

"We've found wood ducks nesting around the lake this past summer, and we're hoping they'll increase as time goes on."

Welch said that the project is expensive, but Big Lake Club realizes that more and more waterfowl habitat is being destroyed each year. The club hopes to offset some of the loss and provide a quality habitat for waterfowl. ♦

flooded woods

This 150-acre natural lake located east of Tulsa is used extensively for waterfowl habitat.

A green-tree reservoir was constructed near the natural lake to improve waterfowl habitat in the area.

Welcome, ducks!

by Rose C. Fleming
Public information specialist, SCS
Jackson, Mississippi

"Mississippi could feed half a million more ducks than it is feeding now. We just need to take advantage of our 40,000 acres in beaver ponds," said Harvey Huffstatler, the energetic young biologist with the Soil Conservation Service at Tupelo.

"And if we managed only 4,000 acres of the 10,000 impounded in floodwater retarding structures, we could have food for 200,000 more ducks."

With cooperation from local landowners, sportsmen, soil and water conservation districts, and agencies such as the Mississippi Game and Fish Commission, the Forest Service, and the Mississippi Forestry Commission, the Soil Conservation Service is moving in this direction in north Mississippi. This is where most of the watershed projects, as well as the beaver ponds, are located.

During 1972, Japanese millet was planted and duck nesting boxes were erected on 13 flood control structures in six counties. Beaver pond development also continued along the lines begun in 1968, when SCS made the first field trial plantings of millet on beaver ponds in Itawamba County.

Huffstatler has inspired much of the current duck activity. Working through conservation districts and SCS district conservationists, he is advising a number of landowners and duck hunting clubs that lease land for waterfowl habitat.

"Until 1968, no waterfowl management techniques had been applied to these areas," said Huffstatler. "We began that year by planting 100 acres for waterfowl habitat. In 1969, landowners in Itawamba County planted about 500 acres, using Japanese millet purchased by hunting clubs. The program has continued.

"Now the hunters have good hunting, and the landowners are realizing an income from the land."

According to Huffstatler, beaver dams must be broken to lower the water so that millet can be planted on the exposed mudflats.

"Japanese millet is the most successful," he said. "It matures in 60 days and produces about 2,000 pounds of seed per acre without fertilization."

To keep hard-working beavers from repairing their dams, SCS recommends a 3-log drain devised some years ago by Dr. Dale Arner, chairman of the Wildlife and Fisheries Department of Mississippi State University.

Once the millet has matured, the log drains are pulled out and the land is flooded as beavers repair the break. It is this area of food and water that attracts and holds ducks.

"We're doing basically the same thing on watershed reservoirs," said Huffstatler, "and actually they're more manageable. There are about 400 of these reservoirs in the state, designed by SCS and installed as part of watershed projects sponsored by local conservation districts. At least 50 percent of the reservoirs are suitable for waterfowl development."

Huffstatler said it is easy to lower and raise the water levels—this is done by adjusting the valves on the risers. SCS is putting duck gates, or additional valves, on these water control structures to allow for a 2- or 3-foot water drawdown.

"Periodic drawdowns are also good for the fish," said Huffstatler. "They allow predacious fish like bass to clean up sunfish, bream, and other fish that tend to overpopulate the lake."

To protect the wood duck, the only significant species that nests in Mississippi, Huffstatler has waged a campaign to get nesting boxes erected. Timber companies, sportsmen, Boy Scouts, and various clubs and agencies have already constructed and erected about 500 boxes around farm ponds, beaver ponds, and reservoirs in north Mississippi.

In Benton County, vocational-agricultural students are building boxes that will be set in place by the Forest Service and the Mississippi Game and Fish Commission. In Itawamba County alone, more than 300 vocational-agricultural students have helped build the boxes.

The Itawamba County *Times* and the Tupelo *Daily Journal* have donated thousands of offset printing plates to wrap around trees, thus protecting the boxes from predators. Huffstatler designed the guards with a wing that snakes cannot crawl over.

The boxes are fastened to poles, posts, and dead trees in or near ponds and reservoirs. They represent one more Mississippi "duck welcome" sign. ♦

A deer project

by James H. Griffin
District conservationist, SCS
Smithfield, North Carolina

What started as conversation in the country stores around Smithfield, North Carolina, ended as a project to bring deer and other wildlife back to a 9,000-acre area of wooded flood plain along the Neuse River.

Forty-four landowners in the area banded together several years ago to form the Hackney Deer Restoration Project. They signed agreements with the North Carolina Wildlife Resources Commission, who stocked the project area with deer, not to allow any hunting on their land for 5 years. Besides deer, there are turkey, ducks, and plenty of raccoon in the area.

Everette G. Barefoot, a Soil Conservation Service conservation technician living in the area, helped in getting the landowners to sign the agreements. Three of the landowners, Erwin Stewart, Waylon Jones, and Macy Hoyle, asked the Johnston Soil and Water Conservation District for help with the project. Their request was approved.

Charlie Woodhouse, wildlife biologist with the North Carolina Wildlife Resources Commission, and SCS specialists checked the project area and rated it excellent for wildlife use.

SCS assisted the landowners in the project area in developing conservation plans for improving wildlife habitat, especially habitat for deer. Plants recommended included fescue-ladino clover, small grain, peanuts, sweet potatoes, soybeans, and corn.

"The project has been a success largely because of the landowners' attitude," explained Erwin Stewart. "Each of us is responsible for keeping poachers out of the area. There have been very few would-be poachers—word gets around."

The North Carolina Wildlife Resources Commission supplied the deer, and people with an interest in wildlife, like Bennie Guien, supplied the hard work that went into a wildlife restoration project for their area.

Stewart is not a deer hunter; he simply loves wildlife. His cousin, Lloyd Stewart, also has much interest in wildlife and in the wildlife restoration project. So has T. O. Massengill, age 84. Massengill says that he is satisfied just to see a deer occasionally and to know that people can work together to accomplish something. He remembers when this same type of project was started about 20 years ago and failed. He helped to steer this new project around the pitfalls encountered in the first effort.

The North Carolina Wildlife Federation recognized Erwin Stewart and the Johnston County Wildlife Club at its annual meeting in 1971 for their work in the Hackney Deer Restoration Project. ♦

A new plant materials center

by Kenneth Croeni
Manager, SCS Plant Materials Center
Lockeford, California

The Soil Conservation Service has a new plant materials center. The new 106-acre center at Lockeford, California, replaces the Pleasanton Plant Materials Center, which had made substantial contributions to California's agriculture since it was established in 1939.

The Pleasanton PMC was sold to the Alameda County Fair Association. Money from the sale was used to purchase land and to develop a modern facility to serve the expanded vegetative program of California's resource conservation districts.

SCS had been searching for a site that had good soils and irrigation water for high-quality seed production. The area had to be one that could continue to serve agriculture as well as other land uses.

One further consideration was that the site had to be near a large transportation center to provide easy access for the many visitors interested and concerned with vegetative programs. Lockeford fulfilled the requirements and was the number one choice out of 17 locations. The site was purchased early in 1970.

The Lockeford PMC is near the little town of Lockeford in the heart of San Joaquin County, one of California's richest agricultural counties. The Mokelumne River serves as one boundary, running the full length of the west side of the property.

A well provides water for irrigation and domestic use. The land has been leveled to a satisfactory grade, and nearly 11,000 feet of irrigation pipeline is installed. The unique irrigation pump can provide a minimum amount of water to small test plots or a large quantity to seed-growing fields.

The architectural firm of Schoenwald, Thomas, Harris, Bode, and Blayney from Fresno designed the headquarters buildings. Paul Harris, the principal architect, used slump stone for the structures to harmonize with the surrounding rural setting. Construction began in the fall of 1970.

The PMC staff transferred grass and shrubs from the Pleasanton site, 72 miles away, to Lockeford. Five acres of valuable native and foreign shrubs have been established and appear to be doing well in their new environment. An acre of grass and legumes in rod rows for critical area stabilization testing is off to a good start. Ten acres of foundation seed were established late in the fall of 1971, and an additional 20 acres were planted in the fall of 1972.

The Lockeford PMC is cooperating with the University of California, the California Division of Highways, the California Department of Fish and Game, resource conservation districts, and the Forest Service's Pacific Southwest Forest and Range Experiment Station (Fire Laboratory) at Riverside, California.

The center serves all of California and part of Nevada—a complex area in which there are more than 700 different soils. Rainfall varies from desert conditions to more than 80 inches; there are wide extremes in temperature. Elevation ranges from below sea level to more than 14,000 feet. The growing season ranges from 135 days in some places to 365 days in others.

The Lockeford PMC is aimed at helping to solve some of the many complex conservation problems of this widely varied area. ♦

Recon . . .

The SEAM team. USDA has assigned leadership for the SEAM program (Surface Environment and Mining) to the Forest Service. In addition to dealing with surface effects of mining activities in the Rocky Mountain area, from Mexico to Canada, the program will concentrate on finding ways to meet the nation's energy and mineral needs while maintaining a quality environment. Surface environment problems related to coal, phosphate, oil, and shale form an important part of the project. The Forest Service plans to work closely with the Department of the Interior's Northern Great Plains Resources Program, the Environmental Protection Agency, and with Montana, Nebraska, North Dakota, South Dakota, and Wyoming in the Old West Regional Commission. Cooperators in the project include universities, colleges, and the Soil Conservation Service.

Be prepared. Oakland, Maryland, was ready, or almost ready, when it learned that an industry wanted to buy about 90 acres of land for its new plant in an area where there was a source for 800,000 gallons of water a day, enough natural gas, electricity, and labor, a school facility to help train workers, an adequate sewer system, an access road, and community facilities—library, hospital. Through the efforts of the Garrett County Development Corporation, which had been preparing for such an opportunity for 10 years, and with the help of the Farmers Home Administration, the Office of Economic Opportunity, the Appalachian Regional Commission, and the Soil Conservation Service, Bausch & Lomb Co., one of the nation's top optical firms, got all it wanted in Garrett County. Bausch & Lomb not only put up its plant and brought a lot of folks back from the cities to join local people in filling the new jobs, but also it built an effluent treatment facility to keep sediment out of clean water.

Lead kills. About 6,000 tons of lead pellets are discharged over waterfowl-use areas in the United States every year. Most of the lead shot falls in deep water, but some falls on hard, shallow bottoms where it can be picked up by ducks and geese and result in poisoning. According to Frank C. Bellrose, a wildlife specialist with the Illinois State Natural History Survey, for all waterfowl species in North America the annual loss because of lead poisoning is 2 or 3 percent of the fall population. With a population of more than 100 million ducks, geese, and swans, the annual loss would be between 2 and 3 million birds.

Well-equipped classroom. Ground was broken late in 1972 for the $1.3 million, 205-acre Sandy Lake Environmental Learning Center in Pennsylvania. The education benefits will come not so much from an interpretative educational building, according to *Teamwork*, January 1973, but mostly from the center's unique natural surroundings. A project of the Penn Soil Resource Conservation and Development Committee, the center is close to many flood prevention projects, wildlife management areas, strip-mine stabilization activities, and numerous farms on which soil and water conservation projects are being implemented.

Recycle nutrients in effluents. Areas treated in the wintertime with chlorinated sewage effluents appear to make a better wildlife habitat than untreated areas, reports Gene W. Wood, wildlife ecologist at Pennsylvania State University. Wood and his associates have found that rabbits in the irrigated areas are generally in better health than those in non-irrigated areas. The effluent improves the nutritive value of forages and grasses, especially for protein, phosphorous, potassium, and magnesium.

Using wood wisely. The wise use of sawmill wastes such as edges and slabs and the residue from plywood plants can go a long way in averting further paper shortages in the United States. For example, in the state of Washington enough such wastes are recovered to equal the fiber production on the annual growth of 3 million acres of forest land, points out R. H. Heintz, extension forester, North Dakota State University.

It's no wonder that the United States has a paper shortage, says Heintz. This country uses 575 pounds of paper per year for each man, woman, and child. This compares to 353 pounds in Sweden, 310 in Canada, 43 in Russia, and only 10 pounds per capita per year in China. No wonder that country appeared so clean when President Nixon's group visited there. The Chinese just don't have paper to throw around!

Review

The Earth Around Us. 1972. *Proceedings of the 27th Annual Meeting of the Soil Conservation Society of America (7515 Northeast Ankeny Road, Ankeny, Iowa 50021). 242 pp., illus.* $5. The 56 articles, by prominent conservationists in federal and state governments, universities, local organizations, and private industry, are of a multidisciplinary nature and contain relevant and timely information on matters relating to resource management and environmental problems. Four of the papers, representing a cross-section sample of the proceedings contents, are titled: "Man's Changing Perception of the Earth," "Managing Land Use," "The Effect of Forest Management on the Environment," and "Detrimental Aspects of Clearcut Logging on Wildlife."

Aerial-Photo Interpretation in Classifying and Mapping Soils. By Soil Survey Staff, Soil Conservation Service. 1966. *Reprinted 1973. USDA Agriculture Handbook 294. 89 pp., illus.* $1.50. Outlines the procedures for conducting a standard aerial survey and for using photo interpretations in making soil surveys.

Producing & Marketing Catfish in the Tennesse Valley. 1971. *Conference Proceedings June 30-July 1, 1971, Tennessee Valley Authority, Office of Tributary Area Development Bull. Y-38. 96 pp., illus.* In addition to giving the background of catfish development, the conference had two main topics for discussion: "Catfish Production Systems and Practices" and "New Developments and Needed Changes in Catfish Production and Marketing Systems." Thirty papers and comments were presented by specialists with federal and state governments, private industry, and universities.

Who Will Control U.S. Agriculture? Harold D. Guither, Editor and Coordinator. 1972. *University of Illinois, College of Agriculture, Cooperative Extension Service (Urbana, Illinois) Special Pub. 27. 56 pp.* Describes the current situation and trends in U.S. agriculture, discusses the factors that will influence its future organization of production, and sketches some of the alternatives and consequences of selected courses of action and their effects upon producers, input suppliers, processors, and consumers.

A Conservation Plan for a Developing Area. 1973. *USDA Program Aid 1029. 6-page illustrated folder.* $0.20. Explains the need for a conservation plan for a developing area; gives an example of such a plan for a housing development that provides for an attractive environment based on careful use of soil, water, and plant resources. The plan is based on interpretations of the soils in the area. A pictorial map is used to show the developer's plan. The folder also provides 13 measures for the developer to undertake to control erosion and sedimentation in the area during and after construction.

Preliminary Reports on Hurricanes and Tropical Storms: Hurricane Agnes, June 14-23, 1972. *U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service. 190 pp.* Gives data about the amount of rainfall, death toll, and damage caused by Hurricane Agnes, the cause of one of the worst natural disasters in United States history. The record-breaking rains caused devastating floods from North Carolina to New York. Hardest hit were Pennsylvania, New York, Virginia, and Maryland. Florida was ravaged by storm tides and tornadoes. All figures in this report are preliminary and subject to change. Data in the death-damage and impact tables combine the best estimates from state climatologists, the Red Cross, and the Office of Emergency Preparedness.

1970 National Survey of Fishing and Hunting. 1972. *U.S. Dept. of the Interior, Bureau of Sport Fisheries and Wildlife Resource Pub. 95. 108 pp., illus., in color.* $1.25. Report of a survey done at intervals of 5 years, conducted in two parts. The first part covers persons 9 years old or older who participated in outdoor recreation. The second part covers in detail the activities of those people who participated substantially in hunting and fishing. The number of fishermen and hunters in the second part totals more than 36 million, who spent $7.1 billion and 910 million recreation days and traveled 39 billion passenger miles.

Indoor-Outdoor Air Pollution Relationships: A Literature Review. By Ferris B. Benson, John J. Henderson, and D. E. Caldwell. 1972. *U.S. Environmental Protection Agency AP-112. 73 pp., illus.* A review was made of all the scant information in published form relating to

indoor-outdoor pollution relationships. The pollutant types considered included gases, particulates, and viable particles (pollen, fungus spores, and bacteria). Building types included residences, offices, laboratories, schools, hospitals, and public buildings. All data of general application to indoor-outdoor pollution relationships are compiled and tabulated in the appendix.

What Is a Farm Conservation Plan? By the Soil Conservation Service. *Rev. 1973. USDA PA-629. 8 pp., illus.* This publication supersedes Leaflet 249, "What Is a Conservation Farm Plan"? It discusses the best ways to get started in conservation farming, gives an example of a plan in color, and explains the benefits resulting from conservation farming to a farmer as an individual and to his community.

National Environmental Study Area: a Guide. *1972. U.S. Dept. of the Interior, National Park Service. [63] pp. $0.75.* A guide to assist teachers and resource managers who want to establish and maintain a national environmental study area. It describes a national environmental study area; outlines the characteristics and procedures of the program; presents the nature, philosophy, and purpose of environmental education; and discusses techniques and methodolgy. A bibliography of useful or provocative publications and films is included.

Weed Control With Phenoxy Herbicides on Native Grasslands. Harry M. Elwell and W. E. McMurphy. *1973. Oklahoma State University, Agricultural Experiment Station Bull. B-706. 22 pp.* Reports and summarizes the results from several experiments conducted at various locations and years in Oklahoma. These studies involved different formulations of 2,4-dichlorophenoxyacetic acid (2,4,-D) and other herbicides, spray dates, years, volumes of spray, rates of active ingredients, and methods of application.

Meetings

April

1–5	American Concrete Pipe Association, Washington, D.C.
1–5	American Road Builders Association, Houston, Tex.
2–6	American Pulpwood Association, Atlanta, Ga.
4–6	Water Resources Congress, Washington, D.C.
7–12	National Planning Conference, Los Angeles, Calif.
8–13	Association for Educational Communication and Technology, Las Vegas, Nev.
9–11	National Water Safety Congress, Tulsa, Okla.
9–15	Earth Week.
15–18	Association of American Geographers, Atlanta, Ga.
16–20	American Geophysical Union, Washington, D.C.
16–20	Western Snow Conference, Grand Junction, Colo.
23–25	National Academy of Sciences, Washington, D.C.

May

7–10	The American Institute of Architects, San Francisco, Calif.
7–11	League of Woman Voters of the U.S., Wash., D.C.
13–15	National Association of Counties, Anchorage, Alaska.
13–15	National Forest Products Association, Wash., D.C.
13–17	American Water Works Association, Las Vegas, Nev.
13–18	National Council of State Garden Clubs, Seattle, Wash.
14–16	Urban Land Institute, Spring Meeting, Minneapolis, Minn.

June

3–6	National Watershed Congress, Wichita, Kansas.
3–7	General Federation of Women's Clubs, Baltimore, Md.
7–11	National Audubon Society, Denver, Colo.
10–15	Outdoor Writers Association of America, Grand Rapids, Mich.
17–20	American Society of Civil Engineers, Lexington, Ky.
17–22	Ecological Society of America, Amherst, Mass.
18–20	American Plywood Association, Gearhart, Oreg.
23–26	Ecology Council of America, Catoctin Mountain Park, Md.
24–28	American Seed Trade Association, Atlanta, Ga.
24–28	National Federation of Business and Professional Women's Clubs, San Juan, Puerto Rico.
24–30	National Environmental Health Association, Atlanta, Ga.
25–29	Air Pollution Control Association, Chicago, Ill.

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From the Administrator:

Wildlife rates the best we can give

For millions of years, wild creatures fended for themselves fairly well against the forces of nature, including disease, predators, and climatic and geologic changes. Some species did very well, evolving into our present varied, beautiful, useful, and indeed necessary forms of wildlife.

But clearly, today's wildlife in this country lives how and where and under conditions that we the people choose, because we control their habitat. We have cut the forests, plowed the prairies, built the cities of this country. And, as we turned the once-untamed land to our uses, we have made the still untamed animals our responsibility.

Most American wildlife is as much a "product" of agricultural land as is corn, cattle, or timber. Rural land is where wild animals live, procreate, and die. It is on farm and ranch lands that they satisfy their basic needs for food, cover, and water.

Farmers and ranchers take this added responsibility seriously. In 1972, farmers, ranchers, and other landowners, with SCS assistance, improved more than 7½ million acres of land and water areas for the benefit of wildlife—a 28-percent increase over the previous year.

In addition, more than half a million acres of our rural land was converted from crop or range land into wildlife and recreation areas during 1972.

But this is only a small part of the farmer's aid to wildlife. Such widespread farm and ranch conservation practices as stripcropping, building ponds—more than 50,000 last year alone, protecting woodland areas, planting windbreaks, and improving rangeland also help to attract many wild creatures.

The Soil Conservation Service has a strong concern for wildlife. We encourage farmers and other landowners to consider wildlife in their land and water use planning, and we stand ready to help them carry out practical measures to do so, such as building watering facilities, planting trees or shrubs to attract wild animals, or using management practices that give a similar result.

In addition, wildlife interpretations are now made for soil surveys in areas where wildlife is, or can be, an important land use. Soils are rated according to their potential for supporting different kinds of wildlife habitat—for grain or seed crops, grasses, herbaceous plants, hardwood trees, shallow water areas, and so on.

Urban people share in the benefits of farmer help to wildlife. As one example, Census Bureau figures show that, in a recent year, two-thirds of America's 14 million hunters did all of their hunting on private land, while nearly 8 million fishermen used small ponds, most of them on rural land.

Farmer, hunter, fisherman, bird-watcher, or city men and women temporarily escaping the pressures of urban life, we all have our reasons for wanting wildlife to thrive in this land of moonshots, color TV, and 50-story buildings. People need wildlife. And a quality environment for people must remember to include a livable environment for the untamed creatures who share our land and water.

Kenneth E. Grant